CLAIMS

What is claimed is:

1. A method for removing particles from a wafer, comprising the steps of:

providing an electropolishing electrolyte solution;

rotating the wafer in said solution; and

imparting a positive electrical charge to the wafer by applying an electrical current to the wafer.

2. The method of claim 1 wherein said electrical current comprises a pulsing electrical current, and further comprising the step of applying a negative electrical charge to the wafer in alternating relationship to said positive electrical charge.

3. The method of claim 1 further comprising a surfactant in said solution.

4. The method of claim 3 wherein said electrical current comprises a pulsing electrical current, and further comprising the step of applying a negative electrical charge to the wafer in alternating relationship to said positive electrical charge.

5. The method of claim 1 wherein said electrical current comprises a continuous electrical current.

6. The method of claim 5 further comprising a surfactant in said solution.

7. The method of claim 3 wherein said surfactant is a surfactant selected from the group consisting of polyethylene glycol, derivatives of polyethylene glycol, polypropylene glycol, and derivatives of polypropylene glycol.

8. The method of claim 7 wherein said electrical current comprises a pulsing electrical current, and further comprising the step of applying a negative electrical charge to the wafer in alternating relationship to said positive electrical charge.

9. The method of claim 7 wherein said electrical current comprises a continuous electrical current.

10. The method of claim 7 wherein said surfactant has a molecular weight of from about 200 to about 50,000.

11. The method of claim 10 wherein said electrical current comprises a pulsing electrical current, and further comprising the step of applying a negative electrical charge to the wafer in alternating relationship to said positive electrical charge.

12. The method of claim 10 wherein said electrical current comprises a continuous electrical current.

13. A method for removing particles from a metal layer on a wafer, comprising the steps of:

providing an electropolishing electrolyte solution;

providing rotational friction between the metal layer and said solution by rotating the wafer in said solution; and

removing metal from the metal layer by electrolysis.

14. The method of claim 13 further comprising the step of electroplating metal onto the metal layer in alternating relationship to said removing metal from the metal layer by electrolysis.

15. The method of claim 13 further comprising a surfactant in said solution, wherein said surfactant is selected from the group consisting of polyethylene glycol, derivatives of polyethylene glycol, polypropylene glycol, and derivatives of polypropylene glycol.

16. The method of claim 14 wherein said metal is removed from the metal layer and said metal is electroplated onto the metal layer in a ratio of from about 2 to about 5 by weight of said metal.

17. A method for removing particles from a via opening lined by a seed layer on a wafer, comprising the steps of:

providing an electropolishing electrolyte solution comprising copper sulfate and sulfuric acid;

providing rotational friction between the seed layer and said solution by rotating the wafer in said solution; and

removing metal from the seed layer by electrolysis.

18. The method of claim 17 further comprising the step of electroplating metal onto the seed layer in alternating relationship to said removing metal from the seed layer by electrolysis.

19. The method of claim 17 further comprising a surfactant in said solution, wherein said surfactant is selected from the group consisting of polyethylene glycol, derivatives of polyethylene glycol, polypropylene glycol, and derivatives of polypropylene glycol.

20. The method of claim 18 wherein said metal is removed from the seed layer and said metal is electroplated onto the seed layer in a ratio of from about 2 to about 5 by weight of said metal.